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SIGDA - The Resource for EDA Professionals

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SIGDA News

1. [Qualcomm Invests \\$100 million for Snapdragon Metaverse Fund](#)

Qualcomm announced this week its Snapdragon Metaverse Fund, which boasts a total investment of \$100 million meant to support both developers and companies actively producing extended reality (XR) ecosystems as well as augmented reality (AR) and artificial intelligence (AI) technologies designed to advance the XR experience.

2. [AMD-Xilinx Debuts First Versal PCIe Accelerator Card](#)

AMD had just barely announced the completion of its acquisition of FPGA maker Xilinx when the entrance sign to the south San Jose Xilinx campus on Union Street flipped over to display the new owner's corporate name and logo. Now, a week later, AMD-Xilinx has announced its first Data Center Accelerator Card based on a member of the Versal ACAP (adaptive compute acceleration platform) AI Core Series.

3. [AMD Allies with Ranovus on Data Center Photonics Module](#)

Ranovus Inc. and its customer AMD/Xilinx demonstrated a module that combines the former's Odin Analog Drive CPO 2.0 and Xilinx's Versal ACAP operating at 800G. The short story is that this thing should make artificial intelligence (AI) workloads in data centers go a lot faster, without consuming quite so much power as otherwise — and do it (Ranovus contends) for a lot less money.

4. [Nvidia Launches Next-Gen GPU Architecture: Hopper](#)

Messages from the EiCs

Dear ACM/SIGDA members,

We are excited to present to you April E-Newsletter. We encourage you to invite your students and colleagues to be a part of the SIGDA newsletter. The newsletter covers a wide range of information from the upcoming conferences to technical news and activities of our community. Get involved and contact us if you want to contribute articles or announcements.

The newsletter is evolving. Please let us know what you think.

Happy reading!

Debjit Sinha, Keni Qiu,
Editors-in-Chief,
SIGDA E-News

Nvidia unveiled its next-generation GPU architecture — named Hopper, alongside the new flagship GPU using the Hopper architecture, the H100. Perhaps surprisingly, Nvidia has not opted to go down the trendy chipleths route favored by Intel and AMD for their mammoth GPUs. While the H100 is the first GPU to use HBM3, its compute die is monolithic, with 80 billion transistors in 814mm² built on TSMC's 4N process. Memory and compute are packaged via TSMC's CoWoS 2.5D packaging.

5. [Marvell targets cloud data centers with silicon photonics platform](#)

Designed to address growing bandwidth demands and high-level applications that rely on artificial intelligence and machine learning, Marvell Technology's latest cloud-optimized 400G DR4 silicon photonics platform is production-ready.

6. [Arm to Make 15% Headcount Cut as it Prepares for Life Beyond Nvidia](#)

Reports emerged today (Tuesday) that Arm is looking to cut up to 15% in its headcount in the U.S. and U.K, from its total of around 6,500 worldwide staff.

What Is

What is trust in AI?

Contributing author: **Paul Bogdan Jack Munushian**

Early Career Chair and Associate Professor of Electrical and Computer Engineering University of Southern California

Intelligence refers to the ability to successfully complete, following a limited set of moral and ethical efforts, a wide range of heterogeneous tasks even though most of them have never been exercised or trained for. Most often, we entrust biological intelligence, not because we can explain it, know that is robust to any unknown perturbations, or be certain that is fair, transparent, and secure, but mostly because of a subjective nature that we hope it obeys a high degree of moral and ethical guidelines (e.g., the trust we put in our leaders or even busses, train and airplane pilots). Of course, intelligence should also be considered in the biological realm where biological neurons and glia populations, microbial communities, stem cells, cancer cells, ant communities, school fish,

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AE for Local chapter news

animal herds and bird flocks are capable of exhibiting a high wide degree of complexity and intelligence [1][9][10][2][8][12]. In light of these arguments about biological intelligence [7][2][8], it became imperiously necessary to know how to define and quantify the trust in an artificial intelligence (AI) system. Despite significant theoretical and experimental efforts, AI systems remain “black-box” entities to any trustworthiness reasoning effort. Simply speaking, we lack the theoretical foundations not only for understanding of how the AI system works or what is their degree of explainability, robustness, resiliency, transparency, fairness, privacy, but most importantly how to deconstruct an AI algorithm to gauge its trust (trustworthiness) value.

Deep learning, as one of the most advanced AI technologies with a wide range of application areas, best reflects this challenge. Research efforts focused on trustworthiness and safety of NNs include two major aspects: (i) certification and (ii) explanation. The former process is held before the arrangement of the model or product to make sure it functions correctly, while the latter tries to explain the behavior of the model or product during its lifetime [11]. Nevertheless, the degree of uncertainty in both the data and the inner workings of the AI algorithms and architectures were not addressed. To tackle this challenge, the DeepTrust [2] exploits second order uncertainty concepts [6] and provides an evidence theory-based trustworthiness evaluation framework that allows to define and quantify the trustworthiness of deep neural networks (DNNs) as a function of the uncertainty in the training dataset and the particular topological and algorithmic features of the DNN. DeepTrust takes into consideration the features of the DNN’s architecture, the training process, the uncertainty involved in data, and quantifies the trustworthiness of a specific DNN architecture as well as the trust values for its predictions. Besides trustworthiness quantification of deep neural networks, the DeepTrust framework has been extended in [4][5] to provide a general trust framework for multi-agent cyber-physical systems (MACPS), such as the intelligent transportation systems and self-driving vehicles. With trustworthiness evaluated for each agent in MACPS, the decision made by intelligent agents prove to be explainable and safe.

In summary, new fresh efforts are needed for constructing the theoretical foundations to define, analyze and optimize the trust (trustworthiness) degree of an AI system as a function of the degree of uncertainty characterizing the datasets as well as the specific features of the AI algorithms and architectures. Coupled with recent efforts in system design automation (SDA), formal methods and emerging technologies, we can not only design and optimize the

Pingqiang Zhou,

AE for Awards

Xun Jiao,

AE for What is

Muhammad Shafique,

AE for What is

Rajsaktish

Sankaranarayanan,

AE for Researcher spotlight

Xin Zhao,

AE for Paper submission

Ying Wang,

AE for Technical activities

Paper Deadlines

ESWEEK'22 - Embedded Systems Week (CASES, CODES+ISSS, and EMSOFT) Hybrid Conference

Shanghai, China

Deadline: April 7, 2022 (Abstracts
due: March 31, 2022)

Oct 7-14, 2022

<http://www.esweek.org>

IWLS'22 - International Workshop on Logic & Synthesis Virtual conference

Deadline: April 18, 2022 (Abstracts
due: April 11, 2022)

Jul 18-21, 2022

<https://www.iwls.org>

MICRO'22 – IEEE/ACM Int'l Symposium on Microarchitecture

Chicago, IL

Deadline: April 21, 2022 (Abstracts
due: April 14, 2022)

October, 2022

overall degree of trust in an AI system, but also its specific computation paradigm (e.g., interactive computing, ubiquitous computing, approximate computing) and device implementation.

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Who's Who

1. Can Li

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<http://www.microarch.org/micro55>

PACT'22 - Int'l Conference on Parallel Architectures and Compilation Techniques

Chicago, IL
Deadline: April 25, 2022 (Abstracts due: April 18, 2022)
Oct 10-12, 2022
<http://www.pactconf.org>

VLSI-SoC'22 – IFIP/IEEE Int'l Conference on Very Large Scale Integration

Patras, Greece Deadline: April 25, 2022 (Abstracts due: April 18, 2022)
Oct 3-5, 2022
<http://www.vlsi-soc.com>

OSCAR'22 - First Workshop on Open-Source Computer Architecture Research

New York (co-located with ISCA 2022)
Abstract deadline: April 27, 2022
June 11, 2022
<https://oscar-workshop.github.io/>

NOCS'22 – IEEE/ACM Int'l Symposium on Networks-on-Chip (co-located with ESWEEK 2022) Hybrid Conference

Shanghai, China
Deadline: May 6, 2022 (Abstracts due: April 29, 2022)
Oct 7-14, 2022
<https://nocs2022.github.io>

HOST'22 – IEEE Int'l Symposium on Hardware-Oriented Security and Trust

Washington DC
Deadline: May 11, 2021 (Abstracts due: April 27, 2021)
June 27-30, 2022
<http://www.hostsymposium.org>

ICCAD'22 – IEEE/ACM Int'l Conference on Computer-Aided

Research interests:

Neuromorphic computing, nanoelectronics devices, non-volatile memories, software-hardware co-optimization

2. Johann Knechtel

Research Scientist

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Personal webpage: <https://wp.nyu.edu/johann/>

Research interests: Hardware Security, Electronic Design Automation (EDA), 3D Integration, Emerging Technologies, Machine Learning

Technical Activities

1. [Quantum Computing: The Bogeyman of Encryption](#)

In the coming years, large-scale quantum computers will make most of the current cryptography techniques insecure. To avoid this, two major global directions are being pursued...

2. [Unlocking the Potential of Molecular Beam Epitaxy](#)

Although molecular beam epitaxy (MBE), one of three types of epitaxy equipment, has long been considered niche, it is poised to transition to volume applications...

3. [Apex.AI Leverages ROS for Autonomous Driving](#)

Multiple segments of the automotive industry have embraced open-source software...

Job Openings

1. Tokyo Institute of Technology, Japan

Job Title: Faculty Positions in Department of Computer Science

Design Hybrid in-person and virtual conference

Deadline: May 23, 2022 (Abstracts due: May 16, 2022)

Oct 30 - Nov 3, 2022

<http://www.iccad.com>

MEMOCODE'22 - IEEE/ACM Int'l Conference on Formal Methods and models for System Design (co-located with ESWEEK 2022) Hybrid Conference

Shanghai, China

Deadline: June 3, 2022 (Abstracts due: May 27, 2022)

Oct 13-14, 2022

<https://memocode2022.github.io>

BioCAS'22 – Biomedical Circuits and Systems Conference

Taipei, Taiwan

Deadline: June 10, 2022

Oct 13-15, 2022

<https://2022.ieee-biocas.org/>

HiPC'22 – IEEE Int'l Conference on High Performance Computing, Data, And Analytics

Deadline: June 24, 2022

(Abstracts due: June 10, 2022)

Dec 18-21, 2022

<http://www.hipc.org>

FPT'22 - Int'l Conference on Field-Programmable Technology Hybrid

Hong Kong, China

Deadline: Jul 15, 2022 (Abstracts due: Jul 8, 2022)

Dec 5-9, 2021

<http://icfpt.org>

ASP-DAC'23 - Asia and South Pacific Design Automation Conference

Miraikan, Tokyo, Japan

Deadline: Jul 29, 2022 (Abstracts due: Jul 24, 2022)

Jan 16-19, 2023

<http://www.aspdac.com>

Description: Systematic design and implementation of data science and AI education programs for the whole university at Tokyo Institute of Technology, and leading the formation of an inter-university educational network for these programs; Teaching classes (in Japanese and English) and research guidance for undergraduate education in the Department of Computer Science and graduate education in the Graduate Major of Artificial Intelligence; Conducting leading and international research in the above area of specialization. Submit your application via the JREC-IN Portal Web Application system (If you have not registered for the system yet, you need to register before applying). Please bundle all the PDF files in the above items 1-8 and the Excel file in item 9 into one zip file, and upload it to the JREC-IN Portal: https://jrecin.jst.go.jp/seek/SeekJorDetail?fn=3&id=D122021406&ln_jor=1 We do not accept submissions by email or other digital formats.

2. Nanyang Technological University, Singapore

Job Title: Professor (Tenured) / Associate Professor (Tenured) in “Wireless Communications”

Description: The candidate is expected to possess an international reputation as a technological leader in wireless communications which includes but not limited to Current and Future Wireless Communication Systems, 5G and Beyond, Wireless Communication Networks, Internet-of-Things (IoT), Vehicle-to-Everything (V2X), and Autonomous Systems etc., and have an excellent record of distinguished academic and scholarly achievements, along with a demonstrated commitment to achieve academic excellence and innovation. Upon the appointment, the job holder is expected to play a leading role in the area of wireless communications for NTU’s School of EEE so as to grow new capabilities, nurture innovative ideas, and develop strategies to secure external resources for wireless communication and networking projects on a sustainable basis. The job holder is also expected to demonstrate academic and research leadership and contribute to the nurturing of young researchers in wireless communications and the broader areas of Electrical and Electronic Engineering. Applicants are invited to submit their applications (cover letter, CV, research and teaching statements, and citation report, where applicable) through the NTU career portal.

Upcoming Conferences

ISQED'22 - Int'l Symposium on Quality Electronic Design
California April 6-8, 2022
<http://www.isqed.org>

RTAS'22 - IEEE Real-Time and Embedded Technology and Applications Symposium
Milano, Italy May 4-6, 2022
<http://2022.rtas.org>

FCCM' 22 - IEEE International Symposium On Field-Programmable Custom Computing Machines
New York May 15–18, 2022
<https://www.fccm.org/>

MDTS'22 – IEEE Microelectronics Design & Test Symposium
Virtual May 23-26, 2022
<http://natw.ieee.org>

ISCAS'22 – IEEE Int'l Symposium on Circuits and Systems
Austin, TX May 28 - June 1, 2022
<http://iscas2022.org>

GLSVLSI'22 – ACM Great Lakes Symposium on VLSI
Orange County, CA June 6-8, 2022
<http://www.glsvlsi.org>

ISCA'22 – Int'l Symposium on Computer Architecture
New York City, USA June 11-15, 2022
<https://iscaconf.org/isca2022/>

LCTES'22 – ACM Int'l Conference on Languages Compilers, Tools

3. Vanderbilt University, US

Job Title: Professor of the Practice of Electrical and Computer Engineering

Description: THE DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING (ECE) AT VANDERBILT UNIVERSITY is seeking applicants for a professor of the practice or lecturer of electrical and computer engineering position with a target start date of Fall 2022. Primary responsibilities are to lead the year-long interdisciplinary senior design course, contribute to the undergraduate ECE curriculum, and assist with programmatic certification. Ideal qualifications include a PH.D. degree in computer engineering, electrical engineering, or a related discipline and prior teaching experience in these programs. This is a term appointment, eligible for renewal, contingent on performance. We are committed to teaching and research excellence and have fully integrated professors of the practice and lecturers into ECE faculty operations. Applications should be submitted on-line at: <http://apply.interfolio.com/102912>. Applications should include a full CV, statement of teaching experience and interests, as well as names and email addresses of three references. Review of applications will begin immediately, and applications will be accepted until the position is filled.

and Theory of Embedded Systems

San Diego, CA June 14, 2022
<https://pldi22.sigplan.org/home/LCTES-2022>

HiPEAC'22: Int'l Conference on High Performance Embedded Architectures & Compilers

Budapest, Hungary June 20-22, 2022
<https://www.hipeac.net/2022/budapest/>

ISVLSI'22 – IEEE Computer Society Annual Symposium on VLSI

Cyprus July 4-6, 2022
<http://www.ieee-isvlsi.org>

ICDCS'22 – IEEE Int'l Conference on Distributed Computing Systems

Bologna, Italy Jul 10 - 13, 2022
<https://www.icdcs.org/>

DAC'22 – Design Automation Conference

San Francisco, CA July 10-14, 2022
<http://www.dac.com/>

ISLPED'21 – ACM/IEEE Int'l Symposium on Low Power Electronics and Design

Boston University, Boston, MA (Hybrid) Aug 1-3, 2022
<http://www.islped.org>

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